User Manual

General Installation Manual for ZDNY SERIES PV Solar Module.

Safety precaution for installing a solar photovoltaic system

Solar modules produce electrical energy when light shines on their front surface.The DC voltage may exceed 30v.If modules are connected in series,the total voltage is equal to the sum of the individual module voltages.If modules are connected in parallel,the total current is equal to the sum of individual module currents.

Keep children well away from the system while transporting and installing mechanical and electrical components.

The electrical characteristics are within ±10 percent of the indicated values of Isc,Voc,and Pmax under standard test conditions(irradiance of 100mW/cm2,AM1.5 spectrums, and a cell temperature of 25℃(77℉)).

Under normal conditions,a photovoltaic module is likely to experience conditions that produce more current and/or coltage than reported at standard test conditions. Accordingly, the values of Isc and Voc marked on this module should be multiplied by a factor of 1.25 when determining component voltage ratings,conductor current ratings,fuse sizes and size of controls connect to the PV output.

Warning:

Please read this manual completely before installing ZDNY series solar modules. This module produces electricity when exposed to light. Follow all applicable electrical safety precautions. Only qualified personnel should install or perform maintenance work on this module.

Do not handle modules when they are wet.

Do not attempt to disassemble the modules, and do not remove any attached nameplates or components from the modules.

Do not apply paint or adhesive to module top surface.

Do not use mirrors or other magnifiers to artificially concentrate sunlight on the modules.

Introductions:

ZDNY series PV Solar Modules come in various sizes to satisfy a full range of applications. Each module is made of crystalline-silicon cells. To protect the cells from the most severe-environmental conditions, modules are made of high transmission rate and low iron tempered glass, anti-aging encapsulation material, and high climate resistant and insulation back sheet by hot laminations, with anodized Aluminum alloy frame and junction box.

Applications:

Modules are reliable, virtually maintenance free power supply, deigned to operate efficiently in

sunlight. By modules, the solar radiant energy is transformed into electrical energy for using. Modules, usually be used as one fittings of PV Solar System. A set of basic PV solar system is consisted of PV solar module, controller, inverter, and storage battery.

Modules can be used in roof PV solar systems, PV stations, building, and other eletrical generation applications etc widely.

MECHANICAL INSTALLATIONS

Mounting Site

Modules can be used on land except for corrosive salt area and sulfurous area.
Excluded applications include, but are not limited to, installations where modules are likely to come in contact with any salt water or where likely to become partially or wholly submerged in fresh or salt water, examples of which include use on boats, docks and buoys, Don't install modules in a location where it would be immersed in water or continually exposed to water from a sprinkler or fountain etc.

Modules are designed for a maximum allowable design pressure of 50 pounds per square foot, about 2400 Pa, which may correspond to a nominal wind speed of approximately 130 km/h in certain circumstances.

Actual maximum allowable wind speed may be influenced by module type, mounting configuration, location, and other factors. In no case should modules be exposed to pressures greater than 50 pounds per square foot of uniformly dis tribute wind, snow, or other loading.

Not install modules near naked flame of flammable materials.

When choosing a site, avoid trees, buildings or obstructions. Modules should be mounted to maximize direct exposure to sunlight and to eliminate or minimize shadowing. Even partial shadowing can substantially reduce module and system output. Furthermore, partial shadowing can elevate the shaded portions internal temperature, which may lower output and shorten module life.

Orientation of installations

Modules may be mounted at any angle from a vertical orientation to a horizontal one. The appropriate fixed tilt angle and azimuth orientation should be used in order to maximize the exposure to sunlight.

Incorrect orientation of modules installation will result in loss of power output. Modules connected in series should be installed at same orientation and angle. Different orientation or angle may cause loss of power output due to difference of amount of sunlight exposed to the modules.

In the Northern Hemisphere, modules should face south, and in the Southern Hemisphere,

modules should face north.

Module tilt angle

Modules produce the most power when they are pointed directly at the sun. For installations where modules are mounted to a permanent structure, modules should be titled for optimum winter performance. As a rule, if the PV system power production is adequate in the winter, it will be satisfactory during the rest of the year. The module tilt angel is measured between the modules and the ground.

Maintenances

It is not uncommon for a remote site to be checked but once per year. Under most conditions, normal rainfall is sufficient to keep the module glass clean. IF diet build-up becomes excessive, clean the glass with a soft cloth using mild detergent and water. Modules that are mounted, flat should be cleaned more often, as they will not self-clean as effectively as modules mounted at a 15^0 tilt or greater.

It is advisable to perform periodic inspection of the modules for damage to glass, back-skin, frame, and support structure.

Check electrical connections for loose connections and corrosion. Check if mounting support structure and modules are loose. Check connections of cables, connectors, and grounding.
Change modules must be the same kind and type, if need.

Modules can operate effectively without ever being washed, although removal of dirt from the front glass can increase output. The glass can be washed with a wet sponge or cloth. Wear rubber gloves for electrical insulation.

Mechanical Installation

1.Selecting the location

Select a suitable location for installation of the module.
The module should be facing true south in northern latitudes and true north in southern latitudes for best power production.
For detailed information on the best elevation tilt angle for the installation, refer to standard solar photovoltaic installation guides or a reputable solar installer or systems integrator.
The module should not be shaded at any time of the day.
Do not use module near equipment or in locacollected.
Selecting the proper support frame

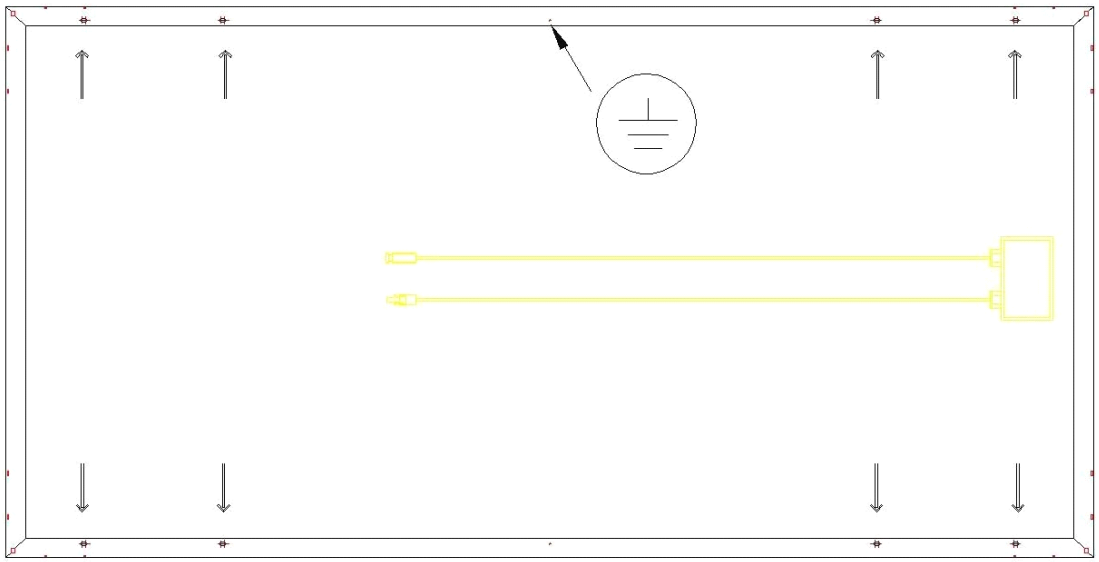
2.Selecting the proper support frame

Always observe the instructions and safety precautions included with the support frame to be used with the module.

No attempt must be made to drill holes in the glass surface of the module. To do so will void the warranty.

Do not drill additional mounting holes in the frame of the module. Doing so will void the warranty.

Modules must be securely attached to the mounting structure using four mounting points for normal installation. If additional wind or snow loads are anticipated for this installation, additional mounting points are also used. Refer to the drawing, below. Load calculations are left to the system designer or installer.



Mounting holes for normal installation

For high wind and snow-loads, these mounting holes must also be used

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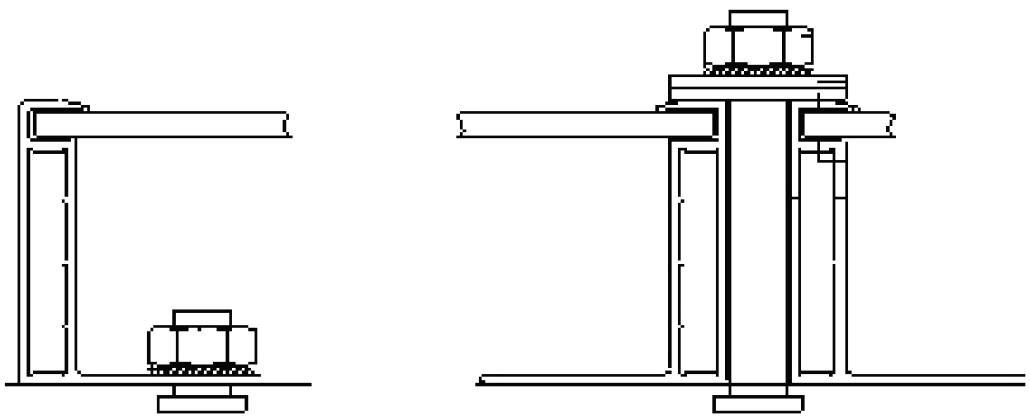
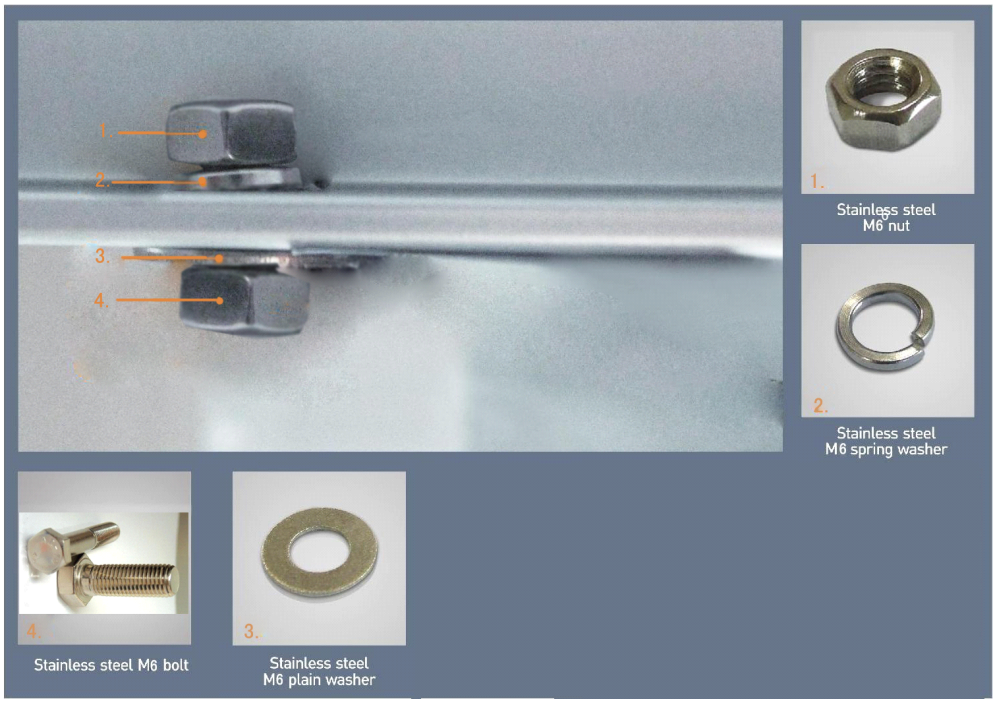




Mounting hole specification is 12-R3.5-7,When installation, pls use M6 bolt, Diameter 8mm and thickness 1 mm of the stainless steel washer, tighten ways as above，fixing moment 12Nm.
The support module mounting structure must be made of durable, corrosion-resistant and UV-resistant material.

3.Ground mount

Select the height of the mounting system to prevent the lowest edge of the module from being covered by snow for a long time in winter in areas that experience heavy snowfalls. In addition, assure the lowest portion of the module is placed high enough so that it is not shaded by plants or trees or damaged by sand and stone driven by wind.

Electrical Installation

1.Grid-connected electrical system

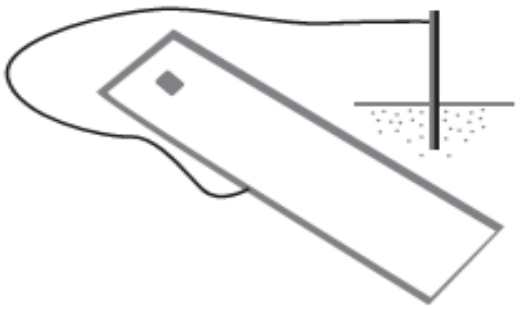
The DC electrical energy generated by photovoltaic systems may also be converted to AC and connected to a utility grid system. As local utilities' policies on connecting renewable energy systems to their grids vary from region to region, consult a qualified system designer or integrator to design such a system. Permits are normally required to install such a system and the utility must formally approve and inspect such a system before it can be connected to the grid.

2.Grounding

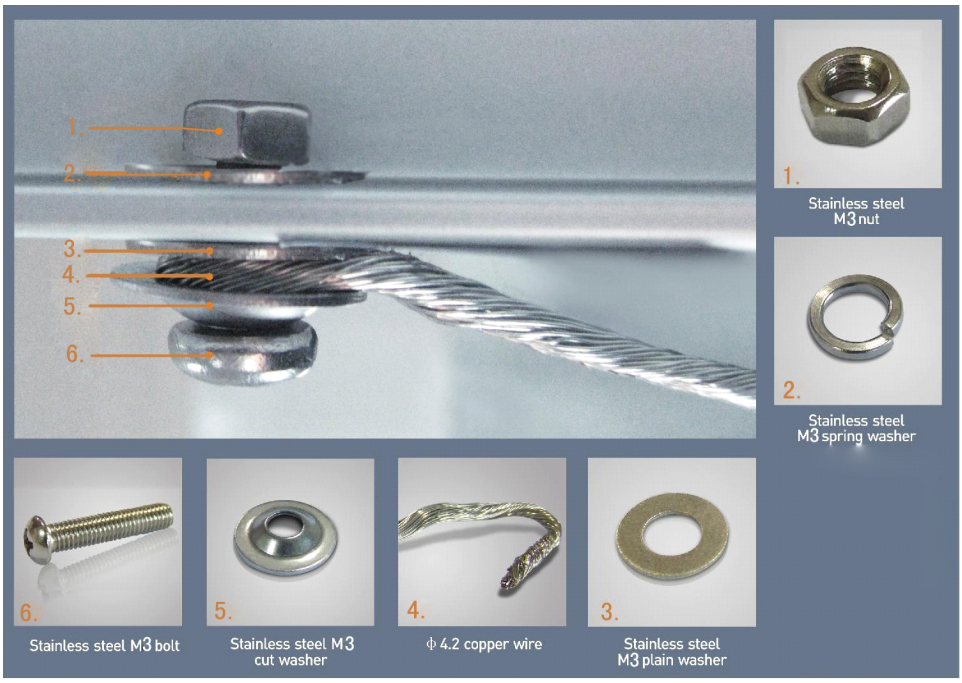
The module frame must be properly grounded (refer to NEC clause 250). The grounding wire must be properly fastened to the module frame to assure good electrical
contact.Use the recommended type, or an equivalent, connector for this wire.
If the support frame is made of metal, the surface of the frame must be electroplated and have excellent conductivity.

The diameter of the earthing pole is M4, M3 stainless steel bolt is used and the fixing moment is

1.5NM. Put the M3 bolt into the earthling pole . Peel off one end of the Model AWG12 of the cable and wind around M3 bolt ， screw down the slotted screw.



using stainless steel M3 screw and hardware as shown below.



Note please use 4mm diameter and 1mm thickness stainless steel washer while using

Further, buildup of hardware for mounting the grounding lug are the same—except for the M3 screw, an added lat washer is mounted directly under the M3 screw head. The star washer is itted directly under the grounding lug and makes electrical contact by penetrating the anodized coating of the aluminum frame, The screw assembly is further itted with a lat washer, then a split lock washer and inally a nut to secure the entire assembly, as shown. Recommended torque of M3 screw assembly is 1.5NM .

3.General installation

Do not use modules of different configurations in the same system.

Several modules are connected in series and then in parallel to form a PV array, especially for application with a high operation voltage. If modules are connected in series, the total voltage is equal to the sum of individual voltages.

For applications requiring high currents, several photovoltaic modules can be connected in parallel; the total current is equal to the sum of individual currents.

Module is supplied with Multicontact connectors (PV GZX0601-1 to use for system electrical connections).Use the National Electric Code to determine system wiring size (refer to NEC clause

310), type and temperature rating of conductors to be connected to the module's connectors. Wiring connected to the module's wiring should be #12 AWG (minimum) and must be temperature rated at 90°C (minimum).

In Canada installation shall be in accordance with CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part 1.

The cross section area of cable and the capacity of connector must be selected to suit the maximum system short circuit current, otherwise the cable and connector will be overheated under large current. Refer to NEC for details.

Module overcurrent protection, rated for DC use. Fuse ratings are as shown the enclosed tables of this Installation Guide.

The junction box is with a breather port. The breather port must be mounted facing down and can not be exposed to rain. Therefore, the junction box must be on the higher side of the module when it is mounted.

Suntellite recommends that all work in commissioning and maintenance of a system must be performed by a qualified solar PV technician!

The recommended maximum series l module configuration is 22 modules.

The recommended maximum parallel module configuration is 3 groups of serie- module numbers。

The maximum series array is 22sets and parallel array is 3 sets while assemble the system

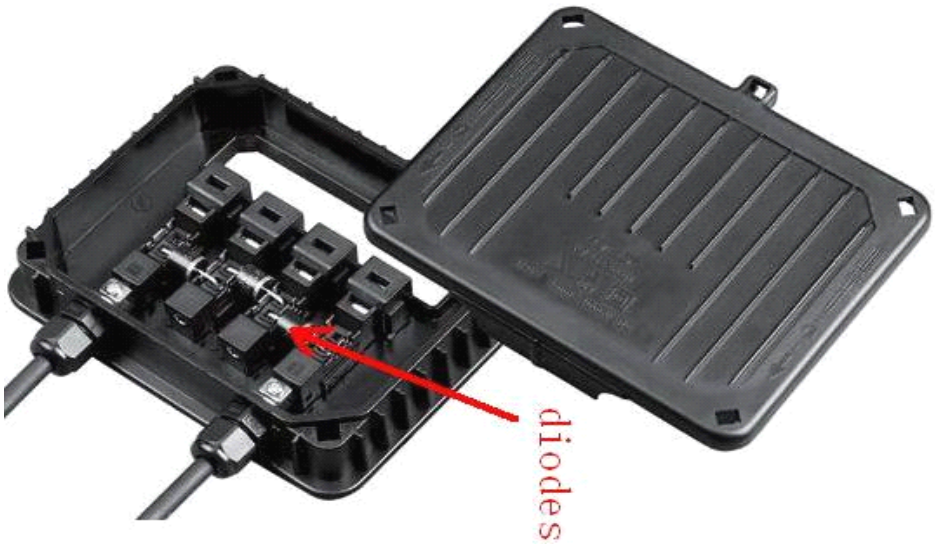
experience conditions that produce more current and/orvoltage than reported at standard test conditions. Accordingly, the valuesof ISC and VOC marked on this module should be multiplied by a factor of 1,25 when determining component voltage ratings, conductor current ratings, fuse sizes, and size of controls connected to the PV output."

Testing and replacing bypass diodes

Removing the bypass diodes should be done only by a competent PV technician and after the module has been disconnected from the system.

Place module face down on a soft, lat surface Insert a 3mm lat screwdriver into the slot on the junction box cover. (The cover has a sign of screwdriver). Gently pull up the four slots until the cover been opened.

Insert the 3mm lat screwdriver into a hole alongside of diode and near one mounting hole of the diode, pry the screwdriver in the opposite direction of diode and gently pull the diode up until the lead comes free. Do the same in the other mounting hole of the diode, and repeat until the diode is free.



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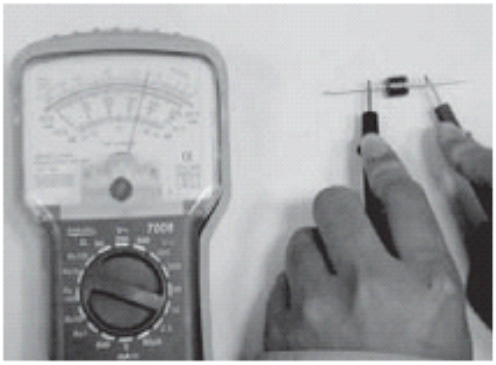
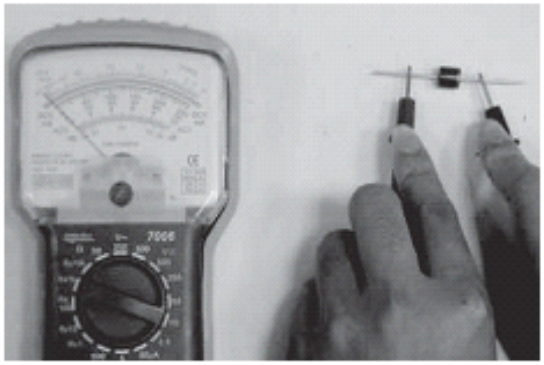
Note the orientations of the polarity markings on the diodes.
The bypass diode type is 12SQ045，rated current 12A。

Check the resistance of the diodes by using the digital multimeter's ohms scale. Resistance should be low in one direction, then when leads are reversed on the diode's terminals the resistance should be high, as illustrated in the two pictures below. If a diode has a low resistance in both directions, it is probably shorted. If it has high resistance in both directions it is probably

open. In either case it should be replaced.





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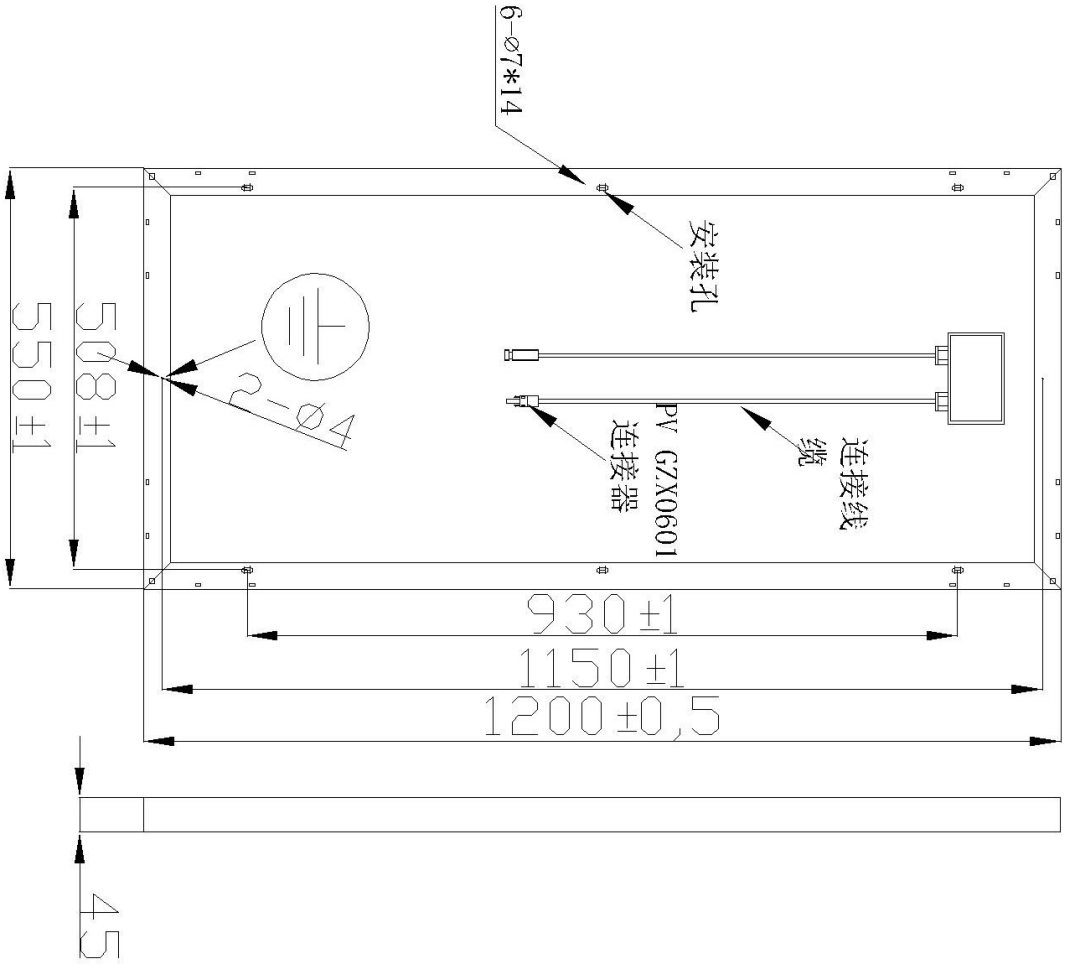
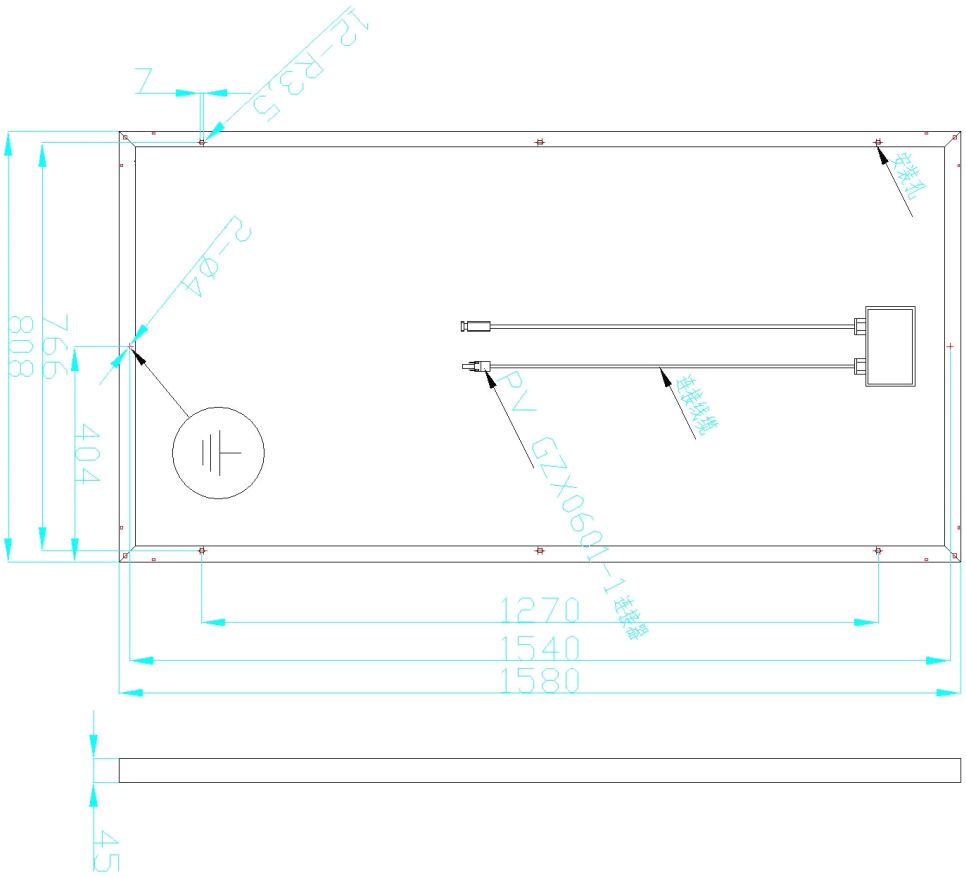
PV modules on the back：

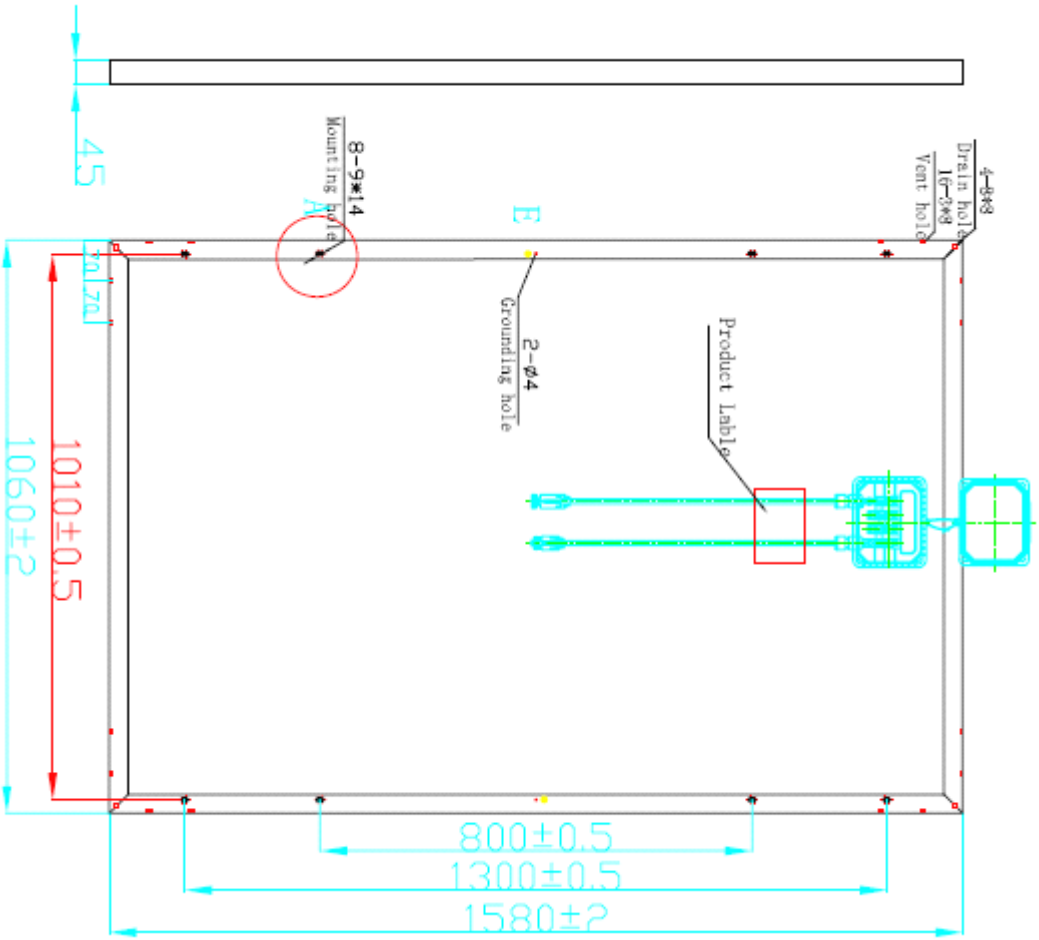


组件规格	Pmax	Voc	Isc	Vm	Im	尺寸
ZDNY-80C36	**80W**	**21.97V**	**4.98A**	**17.39V**	**4.61A**	**1200*550*45/40/35（mm）**
ZDNY-85C36	**85W**	**22.11V**	**5.11A**	**17.71V**	**4.82A**	**1200*550*45/40/35（mm）**
ZDNY-90C36	**90W**	**22.32V**	**5.25A**	**18.11V**	**4.97A**	**1200*550*45/40/35（mm）**
ZDNY-80CB36	**80W**	**21.97V**	**4.98A**	**17.39V**	**4.61A**	**1200*550*45/40/35（mm）**
ZDNY-85CB36	**85W**	**22.11V**	**5.11A**	**17.71V**	**4.82A**	**1200*550*45/40/35（mm）**
ZDNY-90CB36	**90W**	**22.32V**	**5.25A**	**18.11V**	**4.97A**	**1200*550*45/40/35（mm）**



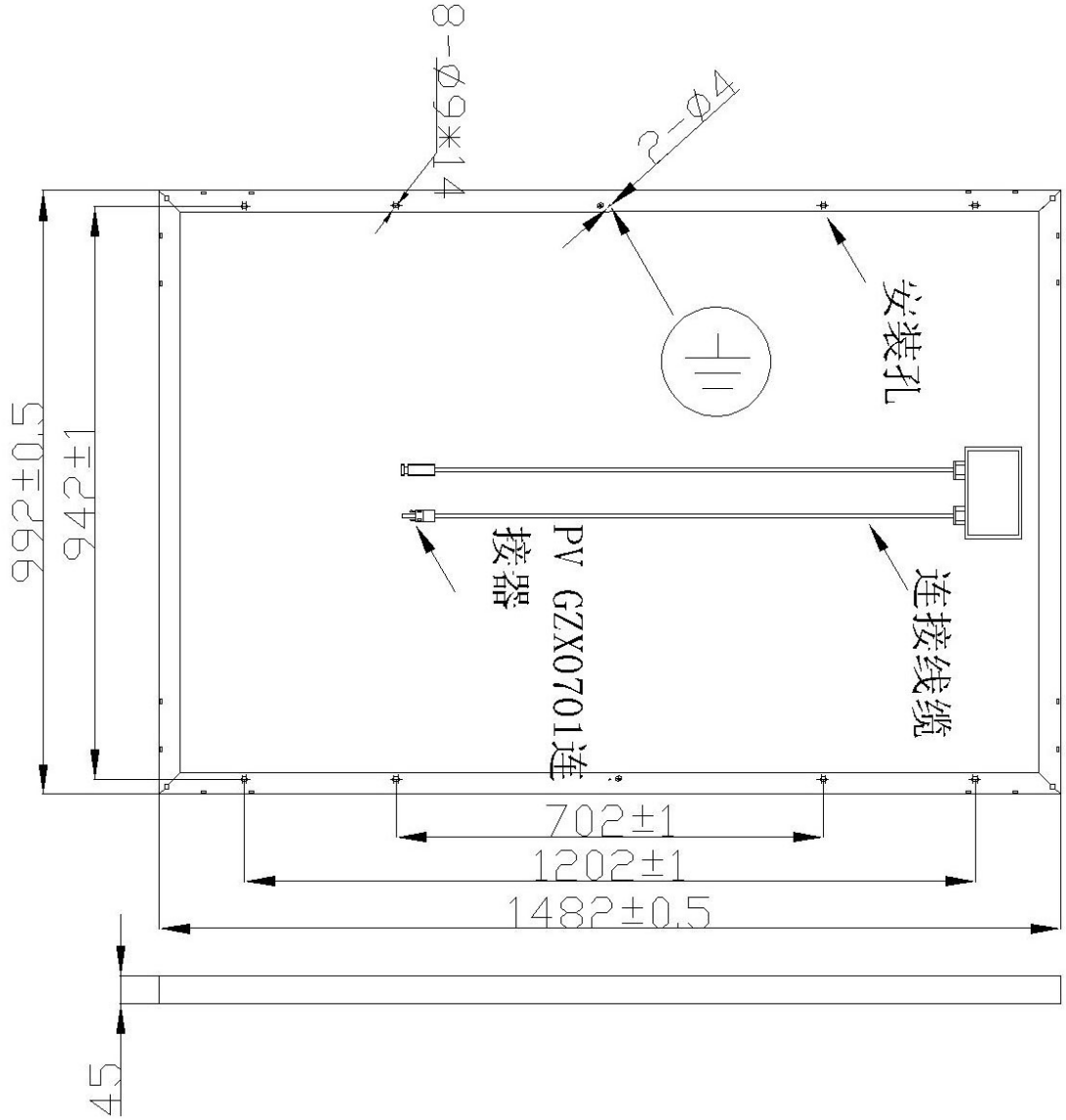
组件规格	Pmax	Voc	Isc	Vm	Im	尺寸
ZDNY-155C	155W	43.72V	4.89A	34.44V	4.50A	1580*808*45/40/35（mm）
ZDNY-160C	160W	43.94V	4.98A	34.77V	4.61A	1580*808*45/40/35（mm）
ZDNY-165C	165W	44.08V	5.03A	35.07V	4.71A	1580*808*45/40/35（mm）
ZDNY-170C	170W	44.22V	5.11A	35.42V	4.82A	1580*808*45/40/35（mm）
ZDNY-175C	175W	44.44V	5.17A	35.75V	4.90A	1580*808*45/40/35（mm）
ZDNY-180C	180W	44.64V	5.25A	36.21V	4.97A	1580*808*45/40/35（mm）
ZDNY-185C	185W	44.80V	5.33A	36.65V	5.05A	1580*808*45/40/35（mm）
ZDNY-188C	188W	44.80V	5.37A	36.92V	5.09A	1580*808*45/40/35（mm）
ZDNY-189C	189W	44.80V	5.39A	36.92V	5.12A	1580*808*45/40/35（mm）
ZDNY-190C	190W	44.80V	5.39A	36.92V	5.15A	1580*808*45/40/35（mm）
ZDNY-195C	195W	44.88V	5.50A	36.94V	5.28A	1580*808*45/40/35（mm）
ZDNY-200C	200W	44.95V	5.65A	36.95V	5.42A	1580*808*45/40/35（mm）
ZDNY-205C	205W	45.03V	5.73A	36.97V	5.55A	1580*808*45/40/35（mm）
ZDNY-155CB	155W	43.72V	4.89A	34.44V	4.50A	1580*808*45/40/35（mm）
ZDNY-160CB	160W	43.94V	4.98A	34.77V	4.61A	1580*808*45/40/35（mm）
ZDNY-165CB	165W	44.08V	5.03A	35.07V	4.71A	1580*808*45/40/35（mm）
ZDNY-170CB	170W	44.22V	5.11A	35.42V	4.82A	1580*808*45/40/35（mm）
ZDNY-175CB	175W	44.44V	5.17A	35.75V	4.90A	1580*808*45/40/35（mm）
ZDNY-180CB	180W	44.64V	5.25A	36.21V	4.97A	1580*808*45/40/35（mm）
ZDNY-185CB	185W	44.80V	5.33A	36.65V	5.05A	1580*808*45/40/35（mm）
ZDNY-188CB	188W	44.80V	5.37A	36.92V	5.09A	1580*808*45/40/35（mm）
ZDNY-189CB	189W	44.80V	5.39A	36.92V	5.12A	1580*808*45/40/35（mm）

ZDNY-190CB	190W	44.80V	5.39A	36.92V	5.15A	1580*808*45/40/35（mm）
ZDNY-195CB	195W	44.88V	5.50A	36.94V	5.28A	1580*808*45/40/35（mm）
ZDNY-200CB	200W	44.95V	5.65A	36.95V	5.42A	1580*808*45/40/35（mm）
ZDNY-205CB	205W	45.03V	5.73A	36.97V	5.55A	1580*808*45/40/35（mm）



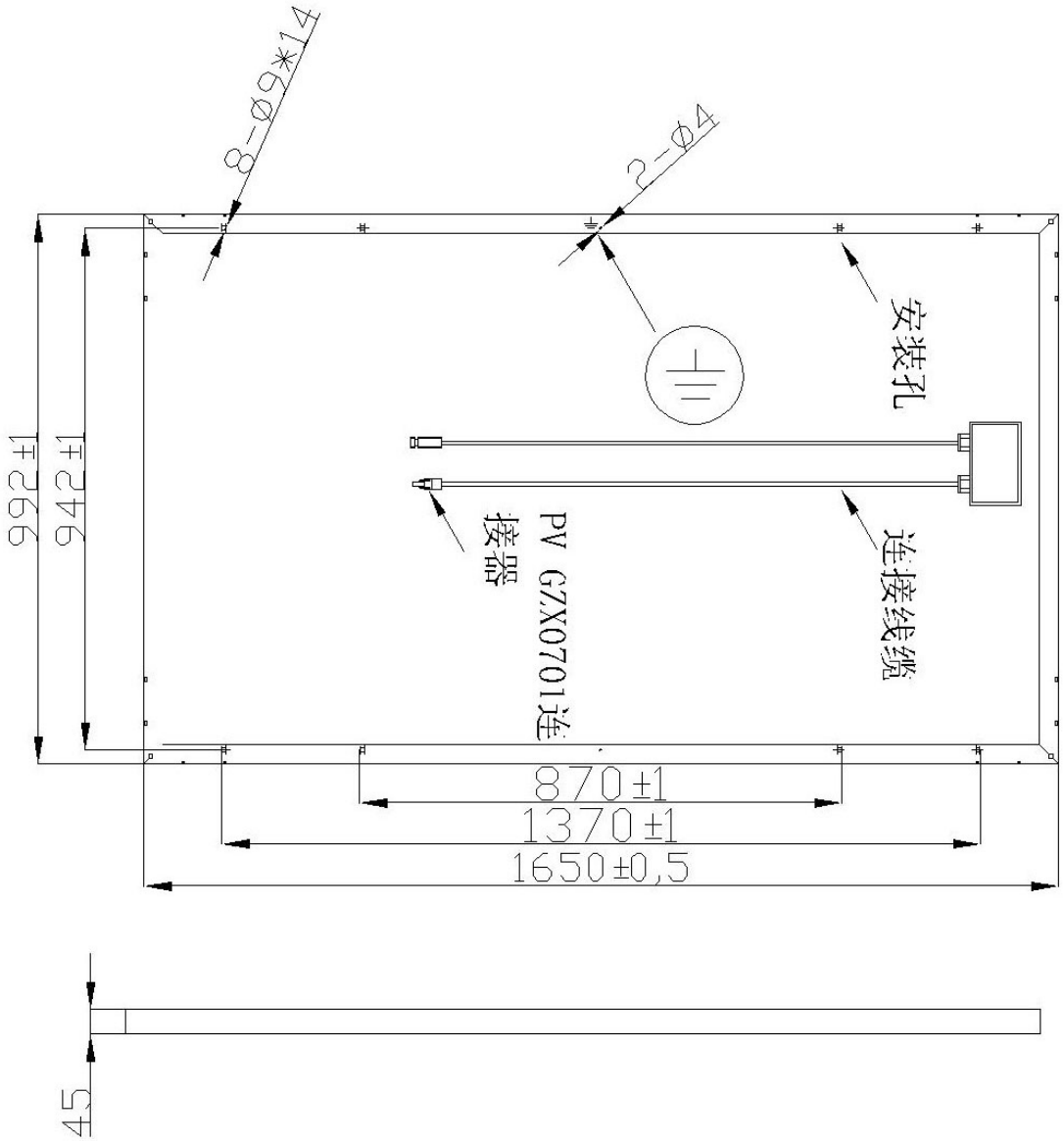
组件规格	Pmax	Voc	Isc	Vm	Im	尺寸
ZDNY-230C	230W	59.00V	5.13A	47.43V	4.85A	1580*1060*45（mm）
ZDNY-235C	235W	59.50V	5.20A	47.68V	4.93A	1580*1060*45（mm）
ZDNY-240C	240W	59.50V	5.24A	48.20V	4.98A	1580*1060*45（mm）
ZDNY-245C	245W	60.04V	5.30A	48.81V	5.02A	1580*1060*45（mm）
DNY-250C	250W	60.58V	5.36A	49.22V	5.08A	1580*1060*45（mm）
ZDNY-255C	255W	60.58V	5.40A	49.23V	5.18A	1580*1060*45（mm）
ZDNY-260C	260W	60.58V	5.51A	49.23V	5.29A	1580*1060*45（mm）
ZDNY-230CB	230W	59.00V	5.13A	47.43V	4.85A	1580*1060*45（mm）
ZDNY-235CB	235W	59.50V	5.20A	47.68V	4.93A	1580*1060*45（mm）
ZDNY-240CB	240W	59.50V	5.24A	48.20V	4.98A	1580*1060*45（mm）
ZDNY-245CB	245W	60.04V	5.30A	48.81V	5.02A	1580*1060*45（mm）
DNY-250CB	250W	60.58V	5.36A	49.22V	5.08A	1580*1060*45（mm）
ZDNY-255CB	255W	60.58V	5.40A	49.23V	5.18A	1580*1060*45（mm）

ZDNY-260CB	260W	60.58V	5.51A	49.23V	5.29A	1580*1060*45（mm）



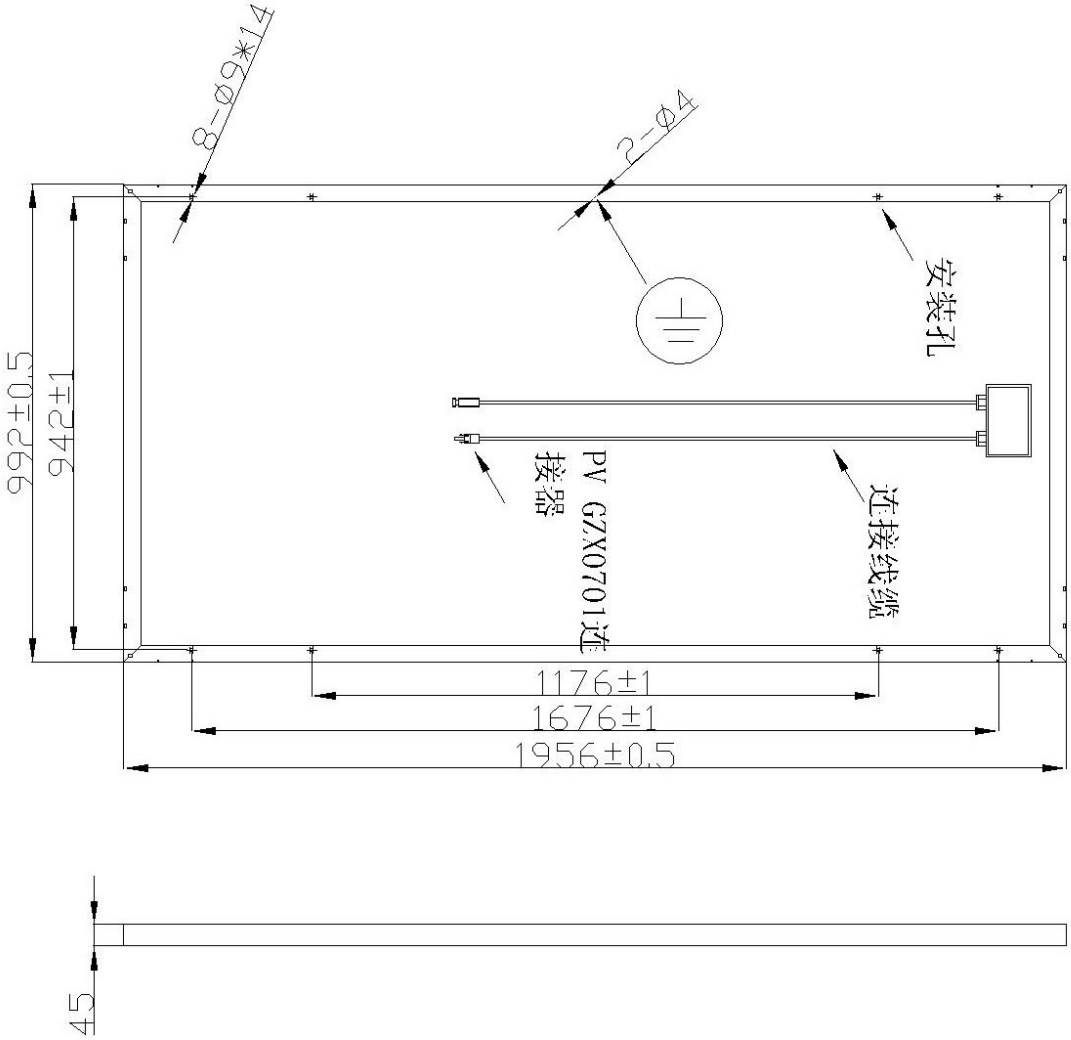
组件规格	Pmax	Voc	Isc	Vm	Im	尺寸
ZDNY-190C54	190W	33.10V	8.12A	25.68V	7.41A	1482*992*45(mm)
ZDNY-200C54	200W	33.14V	8.20A	26.60V	7.53A	1482*992*45(mm)
ZDNY-210C54	210W	33.28V	8.33A	27.21V	7.72A	1482*992*45(mm)
ZDNY-220C54	220W	33.36V	8.42A	27.83V	7.91A	1482*992*45(mm)
ZDNY-230C54	230W	33.45V	8.56A	28.36V	8.12A	1482*992*45(mm)
ZDNY-190CB54	190W	33.10V	8.12A	25.68V	7.41A	1482*992*45(mm)
ZDNY-200CB54	200W	33.14V	8.20A	26.60V	7.53A	1482*992*45(mm)
ZDNY-210CB54	210W	33.28V	8.33A	27.21V	7.72A	1482*992*45(mm)
ZDNY-220CB54	220W	33.36V	8.42A	27.83V	7.91A	1482*992*45(mm)
ZDNY-230CB54	230W	33.45V	8.56A	28.36V	8.12A	1482*992*45(mm)
ZDNY-180P54	180W	32.40V	8.03A	25.70V	7.02A	1482*992*45(mm)
ZDNY-190P54	190W	32.80V	8.12A	26.01V	7.32A	1482*992*45(mm)
ZDNY-200P54	200W	33.35V	8.29A	26.10V	7.68A	1482*992*45(mm)

ZDNY-210P54	**210W**	**33.73V**	**8.38A**	**26.52V**	**7.93A**	**1482*992*45(mm)**
ZDNY-220P54	**220W**	**34.06V**	**8.48A**	**27.10V**	**8.12A**	**1482*992*45(mm)**



组件规格	Pmax	Voc	Isc	Vm	Im	尺寸
ZDNY-210C60	**210W**	**36.20V**	**8.10A**	**28.46V**	**7.39A**	**1650*992*45(mm)**
ZDNY-220C60	**220W**	**36.40V**	**8.20A**	**29.16V**	**7.56A**	**1650*992*45(mm)**
ZDNY-230C60	**230W**	**37.00V**	**8.30A**	**29.76V**	**7.74A**	**1650*992*45(mm)**
ZDNY-240C60	**240W**	**37.76V**	**8.35A**	**30.34V**	**7.92A**	**1650*992*45(mm)**
ZDNY-250C60	**250W**	**37.85V**	**8.40A**	**31.17V**	**8.03A**	**1650*992*45(mm)**
ZDNY-210CB60	**210W**	**36.20V**	**8.10A**	**28.46V**	**7.39A**	**1650*992*45(mm)**
ZDNY-220CB60	**220W**	**36.40V**	**8.20A**	**29.16V**	**7.56A**	**1650*992*45(mm)**
ZDNY-230CB60	**230W**	**37.00V**	**8.30A**	**29.76V**	**7.74A**	**1650*992*45(mm)**
ZDNY-240CB60	**240W**	**37.76V**	**8.35A**	**30.34V**	**7.92A**	**1650*992*45(mm)**
ZDNY-250CB60	**250W**	**37.85V**	**8.40A**	**31.17V**	**8.03A**	**1650*992*45(mm)**
ZDNY-200P60	**200W**	**36.00V**	**8.04A**	**28.15V**	**7.12A**	**1650*992*45(mm)**
ZDNY-210P60	**210W**	**36.30V**	**8.15A**	**28.40V**	**7.40A**	**1650*992*45(mm)**

ZDNY-220P60	220W	36.80V	8.22A	28.65V	7.69A	1650*992*45(mm)
ZDNY-230P60	230W	37.20V	8.29A	29.28V	7.87A	1650*992*45(mm)
ZDNY-240P60	240W	37.70V	8.38A	30.20V	7.96A	1650*992*45(mm)



组件规格	Pmax	Voc	Isc	Vm	Im	尺寸
ZDNY-250C72	250W	44.00V	7.96A	34.30V	7.29A	1956*992*45(mm)
ZDNY-260C72	260W	44.10V	8.07A	35.00V	7.44A	1956*992*45(mm)
ZDNY-270C72	270W	44.15V	8.16A	35.49V	7.62A	1956*992*45(mm)
ZDNY-280C72	280W	44.31V	8.26A	35.95V	7.79A	1956*992*45(mm)
ZDNY-290C72	290W	44.49V	8.42A	36.65V	7.92A	1956*992*45(mm)
ZDNY-300C72	300W	44.62V	8.56A	37.62V	7.98A	1956*992*45(mm)
ZDNY-250CB72	250W	44.00V	7.96A	34.30V	7.29A	1956*992*45(mm)
ZDNY-260CB72	260W	44.10V	8.07A	35.00V	7.44A	1956*992*45(mm)
ZDNY-270CB72	270W	44.15V	8.16A	35.49V	7.62A	1956*992*45(mm)
ZDNY-280CB72	280W	44.31V	8.26A	35.95V	7.79A	1956*992*45(mm)
ZDNY-290CB72	290W	44.49V	8.42A	36.65V	7.92A	1956*992*45(mm)
ZDNY-300CB72	300W	44.62V	8.56A	37.62V	7.98A	1956*992*45(mm)
ZDNY-240P72	240W	43.00V	7.98A	34.10V	7.05A	1956*992*45(mm)
ZDNY-250P72	250W	43.60V	8.10A	34.20V	7.32A	1956*992*45(mm)

ZDNY-260P72	**260W**	**44.00V**	**8.20A**	**34.32V**	**7.58A**	**1956*992*45(mm)**
ZDNY-270P72	**270W**	**44.49V**	**8.31A**	**34.74V**	**7.78A**	**1956*992*45(mm)**
ZDNY-280P72	**280W**	**44.75V**	**8.45A**	**35.28V**	**7.94A**	**1956*992*45(mm)**
ZDNY-290P72	**290W**	**45.20V**	**8.55A**	**35.75V**	**8.12A**	**1956*992*45(mm)**